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MEMORANDUM

To:	Genene Lehotsky and Christine Rothman – City of San Diego Transportation and Storm Water Department
From:	Jake Marcon, Chris Oesch, and Vipul Joshi – Dudek
Subject:	Smythe Channel Proposed Off-Site Mitigation in the Tijuana River Valley
Date:	June 2, 2016
cc:	Mike Sweesy – Dudek
Attachments:	Figures 1–4 Attachment A – Draft ACOE Mitigation Ratio Setting Checklist Attachment B – Wetland Data Determination Forms

This memo presents the findings of a jurisdictional delineation and mitigation assessment conducted by Dudek staff on May 5, 2016, for off-site mitigation of jurisdictional impacts associated with channel maintenance of Smythe Channel (Map 130). An approximately 8.3-acre site in the Tijuana River Valley was identified by Dudek staff, and a field visit was conducted with City of San Diego Transportation & Storm Water Department staff and San Diego Regional Water Quality Control Board (RWQCB) staff on April 28, 2016 (Figures 1 and 2).

The site provides opportunities for rehabilitation and enhancement, and is potentially suitable as mitigation for multiple project sites, in addition to mitigation for Smythe Channel maintenance. The City of San Diego (City) has a Memorandum for the Record (MFR) with the U.S. Army Corps of Engineers (ACOE) for Advanced-Permittee Responsible Mitigation for City of San Diego Essential Public Projects (ACOE 2015). The Smythe Channel mitigation project would likely fall under this MFR.

Based on the jurisdictional delineation, evaluation of potential mitigation areas on site, and using methods discussed with City and RWQCB staff, Dudek estimates that the site would support 1.4 acres of rehabilitation and 4.0 acres of enhancement within the total 8.3-acre area (Figures 3 and 4). At the request of ACOE, Dudek prepared a draft of the ACOE Mitigation Ratio Setting Checklist for the Smythe Channel (Attachment A).

METHODS

On May 5, 2016, Dudek Habitat Restoration Specialist/Biologist Jake Marcon and Biologist Monique O'Connor investigated the proposed off-site mitigation area. Evaluation of the proposed mitigation site included a jurisdictional assessment and an analysis of invasive species cover. ACOE has jurisdiction over a wide floodplain of riparian habitat between existing levees in areas adjacent to the mitigation site (Figure 3). For this reason, ACOE jurisdiction was largely assumed to encompass the entire mitigation site.

PROJECT LOCATION

The proposed mitigation site consists of 8.3 acres of disturbed, mature southern willow riparian forest bordered by the Pilot Channel on the north, County of San Diego lands on the east (and a continuation of the disturbed southern willow riparian forest), a flood control berm and agricultural land on the south, and the previously completed Tijuana River Emergency Channel Mitigation Site and additional disturbed southern willow riparian forest on the west. The proposed mitigation site is located entirely on land owned by the City's Public Utilities Department and is located within the City of San Diego within the Coastal Overlay Zone.

Observed conditions on site included drainage patterns in the soil and wracking, abundant soil moisture, depauperate herbaceous and shrub layers, and a mature southern willow riparian forest canopy. Castor bean (*Ricinus communis*) is the most abundant non-native invasive plant species, both by number of individuals and by coverage, with giant reed (*Arundo donax*) also present. Castor bean inhabits the upper shrub and lower canopy layers, ranging from approximately 4 to 25 feet in height. From an aerial perspective, the majority of the castor bean layer is not visible on a map, as it is covered by the southern willow riparian forest canopy layer. Given the age and stature of the willow canopy, significant deadwood litter is present, covering the mineral soil in many places.

JURISDICATIONAL DELINEATION RESULTS

A formal ACOE jurisdictional wetland delineation was conducted within the mitigation site in accordance with the ACOE *Manual for the Delineation of Wetlands* (ACOE 1987) and the ACOE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (ACOE 2008). Hydrology, vegetation, and soils were examined at three data stations within the site (Figure 4). The proposed mitigation site lies entirely within the riparian floodplain, meaning that each data station is within the same landform. As noted in the wetland determination data forms (Attachment B), the site was determined to contain wetlands as defined by ACOE.

Hydrology

The geomorphology of the site is a wide riparian floodplain. Wetland hydrology indicators were observed at all data stations, including drift deposits, drainage patterns, watermarks, sediment deposits, and a positive facultative (FAC) neutral test. The riparian floodplain contains significant microtopography and visible drainage patterns throughout. Small to moderately sized trash and debris were commonly seen in drift deposits, and likely frequently wash down from upstream. The size of the material indicates that the floodplain receives periodic large flood events.

Vegetation

Hydrophytic vegetation included black willow (*Salix goodingii*), arroyo willow (*Salix lasiolepis*), saltcedar (*Tamarix ramosissima*), mulefat (*Baccharis salicifolia*), and giant reed. Data station one (DS1) was considered problematic for vegetation due to the predominance of castor bean (facultative upland [FACU]), but contained hydric soils and wetland hydrology indicators. For that data station, hydrophytic vegetation was assumed based on consideration of the current condition as a problem area due to invasive species infestation. Invasive species were common throughout the mitigation site.

Soils

Soil pits were dug at the three data stations, shown in Figure 3, to observe soil conditions and determine if hydric soils were present. The proposed mitigation site is entirely within the riparian floodplain, so all soil pits were dug within the same landform. Soil pits were dug at data station one (DS1) and two (DS2) in soil mapped as Chino silt loam, saline, 0–2% slopes. The soil pit at data station three (DS3) was dug in soil mapped as Tujunga sand, 0–5% slope (per Munsell 2000). All data stations were found to have hydric soils (Attachment A).

PROPOSED RESTORATION AREAS

Restoration potential was assessed during the field survey and mapped using GPS equipment with sub-meter accuracy. Additional analysis involved final delineation of selected polygons through aerial interpretation using ArcGIS software. The approximate cover of invasive species was mapped throughout the site as an average for each delineated polygon. The proposed restoration areas, as shown in Figure 4, are adjacent to an existing mitigation site, which would provide enhanced functions and services by providing additional, contiguous habitat acreage (Figure 3). A 15 foot wide buffer was set along the existing equestrian trail where no credits will be pursued. The mitigation project is estimated to provide 1.4 acres of rehabilitation and 4.0 acres of enhancement.

Rehabilitation

Areas within the proposed mitigation site that contained 80% cover of invasive species or more and 0–10% native canopy cover were mapped as rehabilitation areas. These areas total 1.4 acres and are distributed throughout the site (Figure 4). The majority of these areas were monotypic stands of either castor bean or giant reed. Additional rehabilitation areas, though few, contain fig (*Ficus carica*) and eucalyptus (*Eucalyptus camaldulensis*) canopies.

Enhancement

Much of the proposed mitigation site contains significant invasive cover in the understory, but retains a native canopy of black willow. Polygons were created to classify the average approximate cover of invasive species in the understory (Figure 4). Enhancement areas were identified over 6.8 acres of the site. Based on the estimated percent cover of invasive species, 4.0 acres of invasive species cover would be removed. The majority of the proposed mitigation site was mapped to contain 60% cover or greater of invasive species in the understory. In areas where invasive cover in the understory was less, little biodiversity of native species was observed. Invasive species cover was generally less along the western edge of the proposed mitigation site, likely due to adjacency to the existing mitigation area.

Native Areas

Relatively little of the proposed mitigation site contains native areas, mapped as containing less than 20% understory cover of invasive species (0.1 acre). Native areas consist mostly of willows (black and arroyo) with little understory vegetation.

OVERVIEW OF RESTORATION APPROACH

The mitigation strategy for this site would include removal and control of invasive plant species through physical and chemical means. In addition, excess deadwood and organic litter would be removed, as needed, to provide additional exposed soil surface area for planting and seeding with native species. The open dirt area south of the proposed mitigation site could be used as a staging area, pending authorization from the County of San Diego (the landowner). Once the site is prepared, it would be planted and seeded with appropriate native riparian species such as yerba mansa (*Anemopsis californica*), spiny rush (*Juncus acutus* ssp. *leopoldii*), arroweed (*Pluchea sericea*), black elderberry (*Sambucus nigra* L. ssp. *caerulea*), mulefat, and mugwort (*Artemisia douglasiana*). No supplemental irrigation is anticipated to be needed, as soil moisture appears to be suitable to support plantings at current elevations and topography. However, irrigation may be required as an adaptive management option if sufficient soil moisture is not present during the grow-in period of the target vegetation.

Mitigation strategies outlined herein do not include installation of additional plant material of willow (*Salix* spp.), sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), or other common riparian trees associated with typical southern willow riparian forests and scrub due to the infestation of the surrounding riparian corridor by polyphagous shot hole borer (*Euwallacea* sp.). Per guidance by the U.S. Fish and Wildlife Service under consultation with the University of California Riverside Department of Plant Pathology and Microbiology, it is not recommended to add plants that are preferred species for hosting by polyphagous shot hole borer to the area. Due to these specific circumstances, mitigation planting strategies proposed herein differ somewhat from traditional mitigation approaches.

A 5-year maintenance and monitoring period would coincide with the installation of native plant material within the site. Monitoring would assess the health and viability of the installed vegetation and provide supervision concerning long-term restoration of the site during the critical establishment period. Invasive weed intrusions and other maintenance needs would be noted and addressed by a maintenance contractor. Maintenance, performed by a qualified native habitat restoration contractor, would include plant replacement and supplemental seeding, as identified during monitoring events, and could possibly include minor recontouring should a major storm event affect the long-term success of the mitigation site.

DRAFT MITIGATION RATIO SETTING CHECKLIST

Dudek completed a draft of the Mitigation Ratio Setting Checklist for the impacts permitted under Regional General Permit 63 authorization for maintenance of Smythe Channel (Map 130) (SPL-2015-00942-RAG). The draft supports requiring an overall 2:1 mitigation-to-impact ratio, with a 1:1 component of rehabilitation (0.59 acre) and a 1:1 component of enhancement (0.59 acre), for a total of 1.18 acres of mitigation. This is based on qualitative evaluation of the functional losses at the impact site and the functional gains at the mitigation site, with further consideration of risk/uncertainty and temporal loss. The RGP 63 authorization includes Condition #4, which states that "mitigation credits at a Corps-approved mitigation bank [are required] at a minimum 3:1 ratio." Corps-approved mitigation banks at the time of the authorization were limited to sites on the San Luis Rey River, and the mitigation ratio in the authorization accounts for this geographic distance. The proposed mitigation site is within the same watershed as the Smythe Channel maintenance project, and is highly proximate to the impacts.

Table 1 summarizes the proposed mitigation value provided by the mitigation project, the proposed allocation for permanent impacts at Smythe Channel, and the remaining mitigation acreage that would be available to other City Essential Public Projects, in accordance with the MFR.

Table 1
Proposed Mitigation Acreage

	Rehabilitation	Enhancement
Total Proposed Mitigation Areas	1.40 acres	4.04 acres
Proposed Portion for Smythe Channel	0.59 acre	0.59 acre
Remaining for Additional Projects	0.81 acre	3.45 acres

REFRENCES

ACOE (U.S. Army Corps of Engineers). 1987. *Corps of Engineers Wetland Delineation Manual.* Online ed. Environmental Laboratory, Wetlands Research Program Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. January 1987. http://www.fedcenter.gov/Bookmarks/index.cfm?id=6403&pge_id=1606.

ACOE. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).* Environmental Laboratory, ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center. September 2008. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-28.pdf.

ACOE. 2015. *Memorandum for the Record. Subject: Advance Permittee-Responsible Mitigation Related to City of San Diego Essential Public Projects within the County of San Diego.* October 23.

Munsell. 2000. *Munsell Soil Color Charts.* Revised washable edition. New Windsor, New York.

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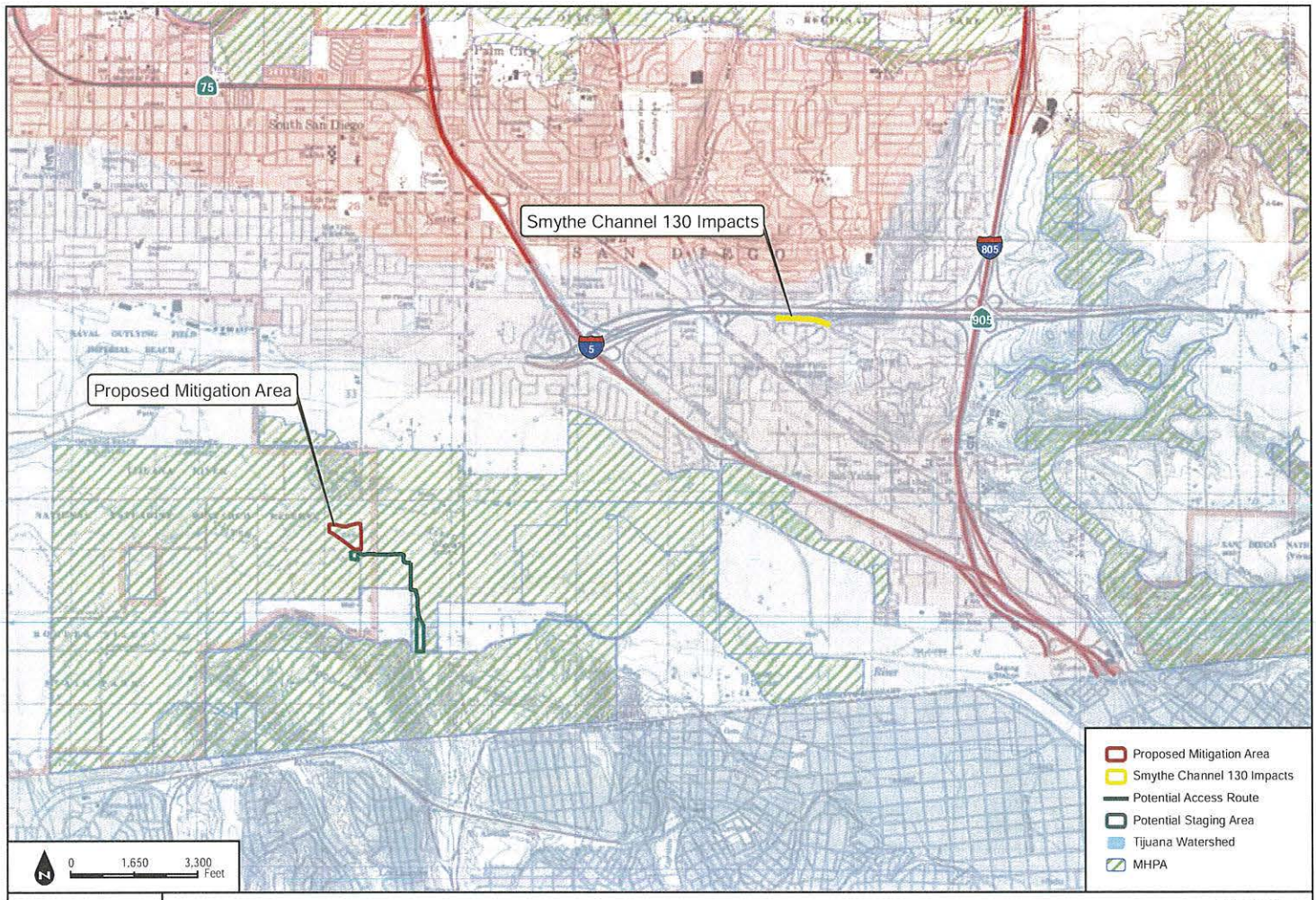
FIGURE 1

Regional Map

City of San Diego - Tijuana River Restoration Project



SOURCE: USGS 7.5-Minute Series - Imperial Beach Quadrangle; SANGIS, 10/25/2003.

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FIGURE 2

Vicinity Map

City of San Diego - Tijuana River Restoration Project

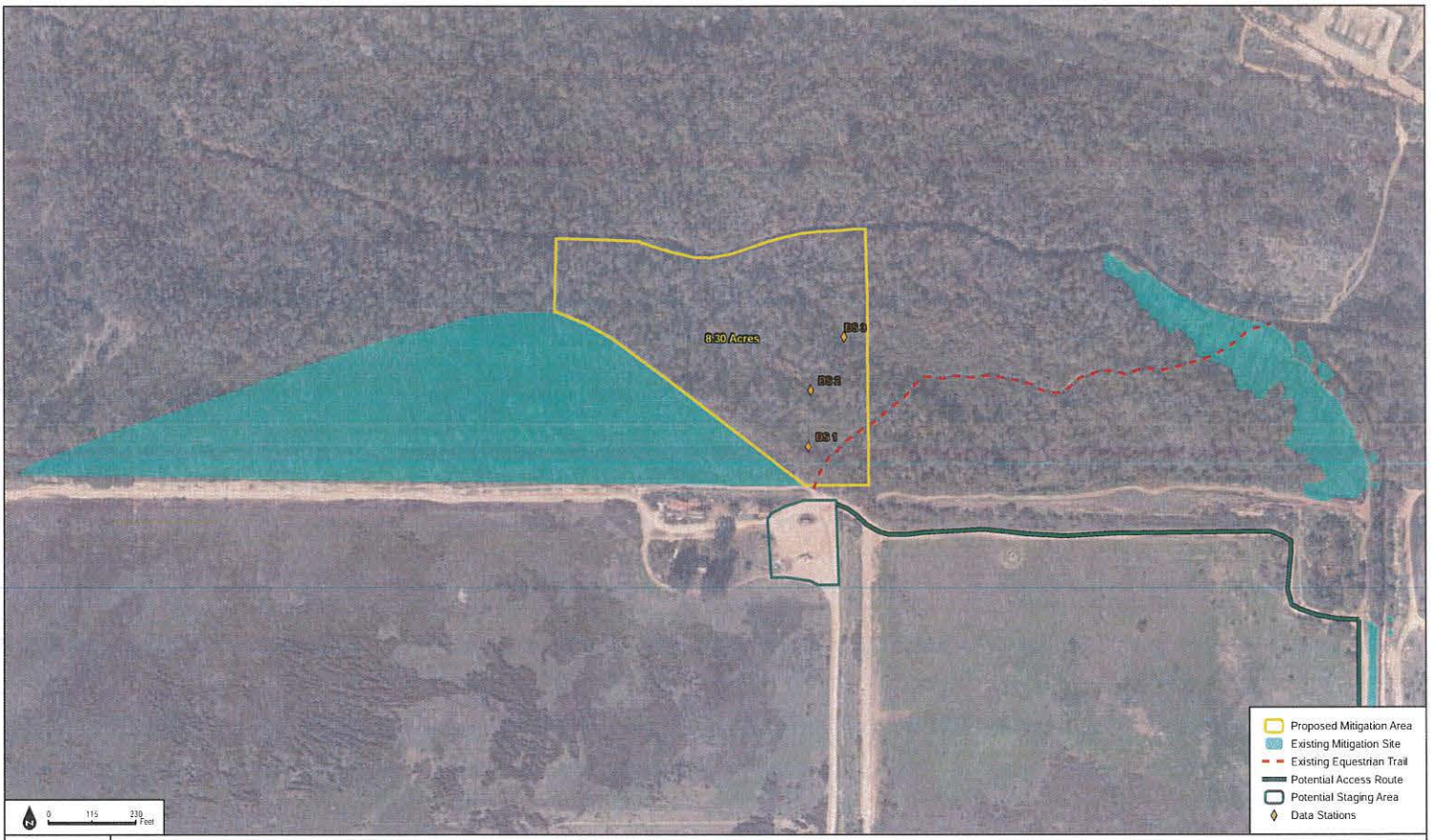

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FIGURE 3
Study Area

City of San Diego - Tijuana River Restoration Project

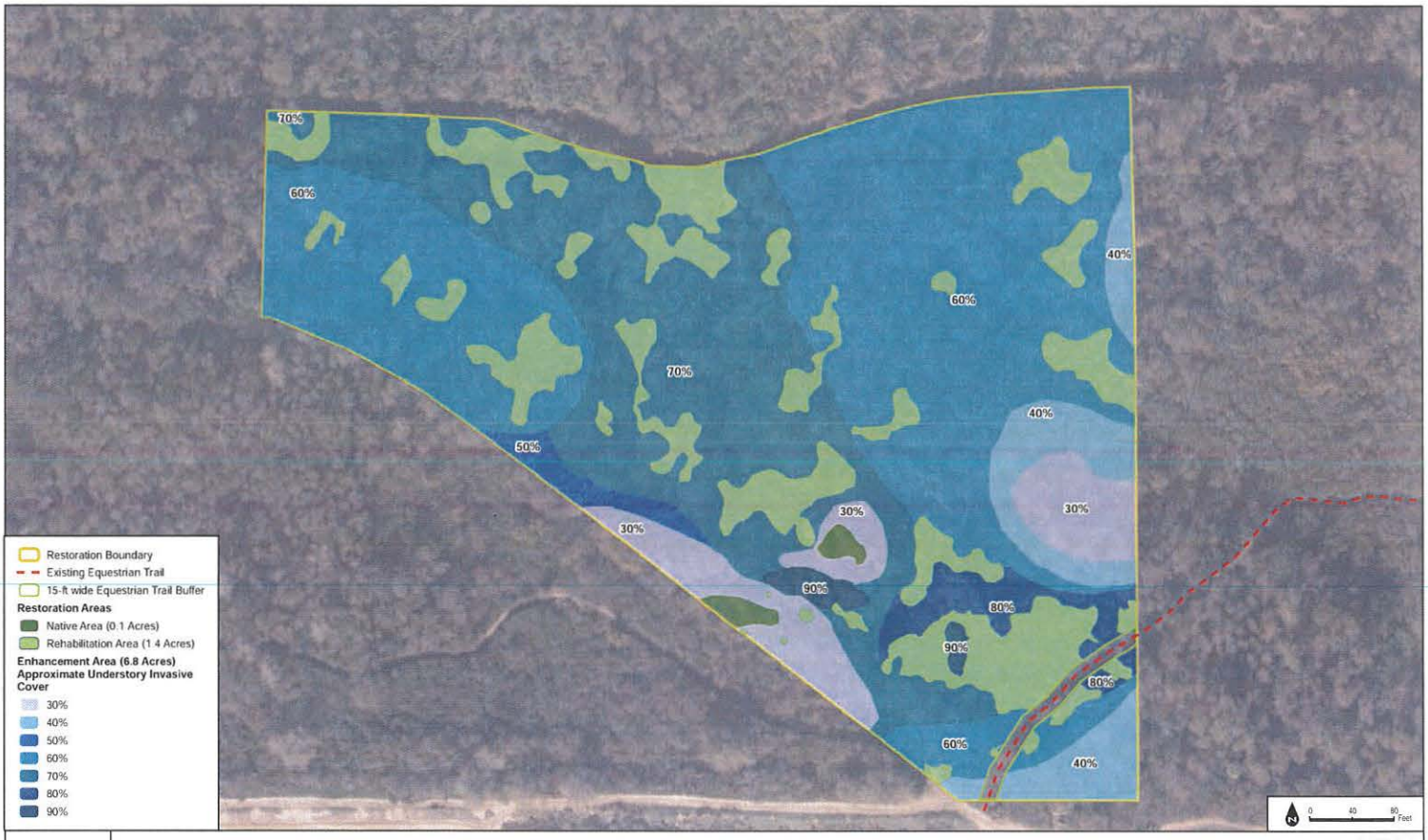

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FIGURE 4
Proposed Restoration Areas

City of San Diego - Tijuana River Restoration Project

ATTACHMENT A

Draft ACOE Mitigation Ratio Setting Checklist

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 5/16/16	Corps File No.:	SPL-2015-00942-RAG	Project Manager:	Rose Galer				
	Impact Site Name:	Smythe Channel	ORM Resource Type:	River/Stream		Hydrology:	Intermittent		
	Impact Cowardin or HGM type:	Riverine	Impact area :	0.59	acres	Impact distance:	1,392	linear feet	
		Column A		**Column B**			**Column C**		
		Mitigation Site Name:	Tijuana River Valley	Mitigation Site Name:	Tijuana River Valley		Mitigation Site Name:		
		Mitigation Type:	Rehabilitation	Mitigation Type:	Enhancement		Mitigation Type:		
		ORM Resource Type:	River/Stream	ORM Resource Type:	River/Stream		ORM Resource Type:		
		Cowardin/HGM type:	River/Stream	Cowardin/HGM type:	River/Stream		Cowardin/HGM type:		
		Hydrology:	Intermittent	Hydrology:	Intermittent		Hydrology:		
2	**Qualitative impact-mitigation comparison:**	Starting ratio:	1.0 : 1.0	Starting ratio:	1.0 : 1.0		Starting ratio:	1.0 : 1.0	
		Ratio adjustment:	-2.0	Ratio adjustment:	-1.0		Ratio adjustment:		
		Baseline ratio:	1.00 : 3.00	Baseline ratio:	1.00 : 2.00		Baseline ratio:	1.00 : 1.00	
		PM justification:	see tab 2	PM justification:	see tab 2		PM justification:	see tab 2	
3	**Quantitative impact-mitigation comparison:**	Ratio adjustment from BAMI procedure (attached):	#DIV/0! : #DIV/0!	Ratio adjustment from BAMI procedure (attached):	#DIV/0! : #DIV/0!		Ratio adjustment from BAMI procedure (attached):	#DIV/0! : #DIV/0!	
4	**Mitigation site location:**	Ratio adjustment:	0	Ratio adjustment:	0		Ratio adjustment:		
		PM justification: Per narrative on Tab 2, the maintenance action itself provides functional lifts, including contaminated sediment removal and improved flow.		PM justification: Per Column A, Enhancement would be located at same mitigation site.			PM justification:		
5	**Net loss of aquatic resource surface area:**	Ratio adjustment:	0	Ratio adjustment:	1		Ratio adjustment:		
		PM justification: Mitigation credits are rehabilitation affecting no-net-loss.		PM justification: Mitigation credits are enhancement affecting no-net-loss.			PM justification:		
6	**Type conversion:**	Ratio adjustment:	0	Ratio adjustment:	0		Ratio adjustment:		
		PM justification: Mitigation site consists of riparian scrub habitat, similar to impact site.		PM justification: Mitigation site consists of riparian scrub habitat, similar to impact site.			PM justification:		
7	**Risk and uncertainty:**	Ratio adjustment:	3	Ratio adjustment:	2		Ratio adjustment:		
		PM Justification: Mitigaton site requires minimal alteration of existing conditions, but is dependent on adequate soil moisture conditions and native recruitment.		PM Justification: Mitigaton site requires minimal alteration of existing conditions, but is dependent on adequate soil moisture conditions and native recruitment.			PM justification:		
8	**Temporal loss:**	Ratio adjustment:	1	Ratio adjustment:	1		Ratio adjustment:		
		PM justification: Impact occurred in Jan 2016. Rehabilitation area will be installed Fall 2017.		PM justification: Impact occurred in Jan 2016. Rehabilitation area will be installed Fall 2017.			PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2 or 3:	1.00 : 3.00	Baseline ratio from 2 or 3:	1.00 : 2.00		Baseline ratio from 2 or 3:	#DIV/0! : #DIV/0!	
		Total adjustments (4-8):	4	Total adjustments (4-8):	4		Total adjustments (4-8):	0	
		Final ratio:	**5.00 : 3.00**	Final ratio:	**5.00 : 2.00**		Final ratio:	**#DIV/0! : #DIV/0!**	
		Proposed impact (total):	0.59 acres	Remaining impact:	0.24 acres		Remaining impact (acres):	0.00 acres	
			1392 linear feet		557 linear feet		Remaining impact (linear feet):	0 linear feet	
		to Resource type:	0	to Resource type:	0		to Resource type:	0	
		Cowardin or HGM:	Riverine Intermitten	Cowardin or HGM:	Riverine		Cowardin or HGM:	Riverine	
		Hydrology:	t	Hydrology:	Intermittent		Hydrology:	Intermittent	
		Required Mitigation*:	0.98 acres	Required Mitigation*:	0.59 acres		Required Mitigation:	#DIV/0! acres	
			6960 linear feet		1392.0 linear feet			#DIV/0! linear feet	
		of Resource type:	River/Stream	of Resource type:	River/Stream		of Resource type:	0	
		Cowardin or HGM:	River/Stream	Cowardin or HGM:	River/Stream		Cowardin or HGM:	0	
		Hydrology:	Intermittent	Hydrology:	Intermittent		Hydrology:	0	
		Proposed Mitigation**:	0.59 acres	Proposed Mitigation**:	0.59 acres		Proposed Mitigation**:	acres	
			830 linear feet		830 linear feet			linear feet	
		Impact Unmitigated:	40 %	Impact Unmitigated:	0 %		Impact Unmitigated:	%	
			0.24 acres		0.00 acres			acres	
		Additional PM comments: Mitigation site provides substantial functional gains compared to functional loss from maintenance. These overall gains are commensurate with the moderate risk/uncertainty and minimal temporal loss of proposed rehabilitation.		Additional PM comments: Mitigation site provides substantial functional gains compared to functional loss from maintenance. These overall gains are commensurate with the moderate risk/uncertainty and minimal temporal loss of proposed enhancement.			Additional PM comments:		
10	**Final compensatory mitigation requirements:**	Final requirement is for 0.59 acres of rehabilitation and 0.59 acres of enhancement, an overall 2:1 mitigation to impact ratio. This ratio is justified based on the functional gains of the mitigation site compared with the function loss associated with maintenance of sediment and vegetation at the impact site.							

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Step 2: Qualitative comparison of functions (functional loss vs. gain)

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	mod gain	mod gain
Subsurface water storage	small loss	small gain
Moderation of groundwater flow or discharge	no change	no change
Dissipation of energy	mod loss	mod gain
Cycling of nutrients	mod loss	mod gain
Removal of elements and compounds	small gain	mod gain
Retention of particulates	small loss	mod gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Adjustment: -3

PM Justification: Impact site has an overall small loss of function due to removal of vegetation from an urban area where it does not support diverse or sensitive species. Impact site actually has some functional gains due to the removal of contaminated sediments and improved flow dynamics. Rehabiltiation areas provide substantial gains in a variety of functions, including connectivity to surrounding habitat, non-urban landscape context, and adjacency to existing mitigation sites.

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage	mod gain	small gain
Subsurface water storage	small loss	small gain
Moderation of groundwater flow or discharge	no change	no change
Dissipation of energy	mod loss	small gain
Cycling of nutrients	mod loss	small gain
Removal of elements and compounds	small gain	small gain
Retention of particulates	small loss	small gain
Export of organic carbon	small loss	small gain
Maintenance of plant and animal communities	small loss	mod gain

Adjustment: -1

PM Justification: Impact site has an overall small loss of function due to removal of vegetation from an urban area where it does not support diverse or sensitive species. Impact site actually has some functional gains due to the removal of contaminated sediments and improved flow dynamics. Enhancement areas have small to moderate gains in a variety of functions, including connectivity to surrounding habitat, non-urban landscape context, and adjacency to existing mitigation sites.

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		

Adjustment:

PM Justification:

Maintenance of plant and animal communities		

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

ATTACHMENT B

Wetland Data Determination Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Tijuana River Mitigation Site | City/County: San Diego | Sampling Date: 05/10/2016
Applicant/Owner: | State: CA | Sampling Point: DS1
Investigator(s): Jake Marcon | Section, Township, Range:
Landform (hillslope, terrace, etc.): Riparian floodplain | Local relief (concave, convex, none): None | Slope (%):
Subregion (LRR): C - Mediterranean California | Lat: 32 33.075' N | Long: 117 5.600' W | Datum:
Soil Map Unit Name: Chino silt loam, saline, 0 to 2 percent slopes | NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)
Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )
Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (●)	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Hydrophytic vegetation is assumed because the current condition is significantly disturbed. Failed vegetation index because of weedy Ricinus communis

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix goodingii*	60	Yes	FACW
2. *Myoporum laetum*	15		FACU
3. *Ricinus communis*	5		FACU
4.			
Total Cover:	80 %		
Sapling/Shrub Stratum			
1. *Ricinus communis*	70	Yes	FACU
2.			
3.			
4.			
5.			
Total Cover:	70 %		
Herb Stratum			
1. *Tropaeolum majus*	15	Yes	UPL
2. *Ricinus communis*	15	Yes	FACU
3. *Sonchus asper*	2		FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	32 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % | % Cover of Biotic Crust %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	60	x 2 =	120
FAC species	2	x 3 =	6
FACU species	105	x 4 =	420
UPL species	15	x 5 =	75
Column Totals:	182 (A)		621 (B)

Prevalence Index = B/A = 3.41

Hydrophytic Vegetation Indicators:
- (●) Dominance Test is >50%
- (●) Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (●)

Remarks: Removal of Ricinus communis would cause this station to have hydrophytic vegetation.

SOIL

Sampling Point: DS1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
1-5	10YR 3/2	100					Clay Loam	
6-20	10YR 3/1	80					Clay Loam	
	10YR 3/2	20					Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Soil wet from recent precipitation

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water Marks (B1) (**Riverine**)
- ☒ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: wrack present, water marks on Ricinus communis trunks, soil surface very wet

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Tijuana River Mitigation Site | City/County: San Diego | Sampling Date: 05/10/2016
Applicant/Owner: | State: CA | Sampling Point: DS2
Investigator(s): | Section, Township, Range:
Landform (hillslope, terrace, etc.): Riparian floodplain | Local relief (concave, convex, none): None | Slope (%):
Subregion (LRR): C - Mediterranean California | Lat: 32 33.098' N | Long: 117 5.603' W | Datum:
Soil Map Unit Name: Chino silt loam, saline, 0 to 2 percent slopes | NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )
Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	30	Yes	FACW
2. *Salix goodingii*	15		FACW
3. *Tropaeolum majus*	2		FAC
4.			
Total Cover:	47 %		
Sapling/Shrub Stratum			
1. *Salix lasiolepis*	40	Yes	FACW
2. *Ricinus communis*	35		FACU
3. *Tropaeolum majus*	5		UPL
4.			
5.			
Total Cover:	80 %		
Herb Stratum			
1. *Tropaeolum majus*	70	Yes	UPL
2. *Ricinus communis*	25		FACU
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	95 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	85	x 2 =	170
FAC species	2	x 3 =	6
FACU species	60	x 4 =	240
UPL species	75	x 5 =	375
Column Totals:	222 (A)		791 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Salix goodingii snag within plot (not counted)

SOIL

Sampling Point: DS2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
1-4	10YR 3/2	70					Silty Clay	
	10YR 2/1	30					Silty Clay	fine grain size
4-23	10YR 4/2	85					Clay	
	10YR 2/1	15					Clay	fine grain size

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Soil wet, top layer very smooth potentially due to wetness (almost greasy)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Trash within wrack, FAC neutral = 3:3

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Tijuana River Mitigation Site | City/County: San Diego | Sampling Date: 05/10/2016
Applicant/Owner: | State: CA | Sampling Point: DS3
Investigator(s): | Section, Township, Range:
Landform (hillslope, terrace, etc.): Riparian floodplain | Local relief (concave, convex, none): None | Slope (%):
Subregion (LRR): C - Mediterranean California | Lat: 32 33.122' N | Long: 117 5.580' W | Datum:
Soil Map Unit Name: Tujunga sand, 0 to 5 percent slope | NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )
Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes (•)	No ( )	**Is the Sampled Area within a Wetland?** Yes (•) No ( )
Wetland Hydrology Present?	Yes (•)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarix ramosissima*	15	Yes	FAC
2. *Salix goodingii*	10		FACW
3. *Salix laevegata*	5		FACW
4. *Arundo donax*	5		FACW
Total Cover:	35 %		
Sapling/Shrub Stratum			
1. *Tamarix ramosissima*	30	Yes	FAC
2. *Arundo donax*	20		FACW
3. *Baccharis salicifolia*	20		FAC
4.			
5.			
Total Cover:	70 %		
Herb Stratum			
1. *Phacelia cicutaria*	15	Yes	Not Listed
2. *Baccharis salicifolia*	5		FAC
3. *Tamarix ramosissima*	2		FAC
4.			
5.			
6.			
7.			
8.			
Total Cover:	22 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species		x 1 =	0	
FACW species	40	x 2 =	80	
FAC species	72	x 3 =	216	
FACU species		x 4 =	0	
UPL species	15	x 5 =	75	
Column Totals:	127	(A)	371	(B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: Large amount of thatch

SOIL

Sampling Point: DS3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
1-4	10YR 4/2	100					Sandy Clay Loam	
4-7	10YR 5/4	100					Loamy Sand	
7-20	10YR 7/3	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: FAC neutral = 4:1